The influence of age and gender on ultra-rapid categorization

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Introduction

Ultra-fast categorization paradigm

(paradigm by Thorpe and colleagues, 1996)

Participants get a clear categorization goal in advance and succeed at detecting the object (animal) almost perfectly. Studies consistently report population-level reaction time differences in performance on different categorization tasks explained by a superordinate advantage (animal vs dog), perceptual similarity (animals vs vehicles) and object category size (natural vs animal vs dog).

In a previous study (Vanmarcke & Wagemans, 2015), we replicated these separate findings and found subtle, yet consistent, gender differences in typically developing adults (women faster than men).

Current study description

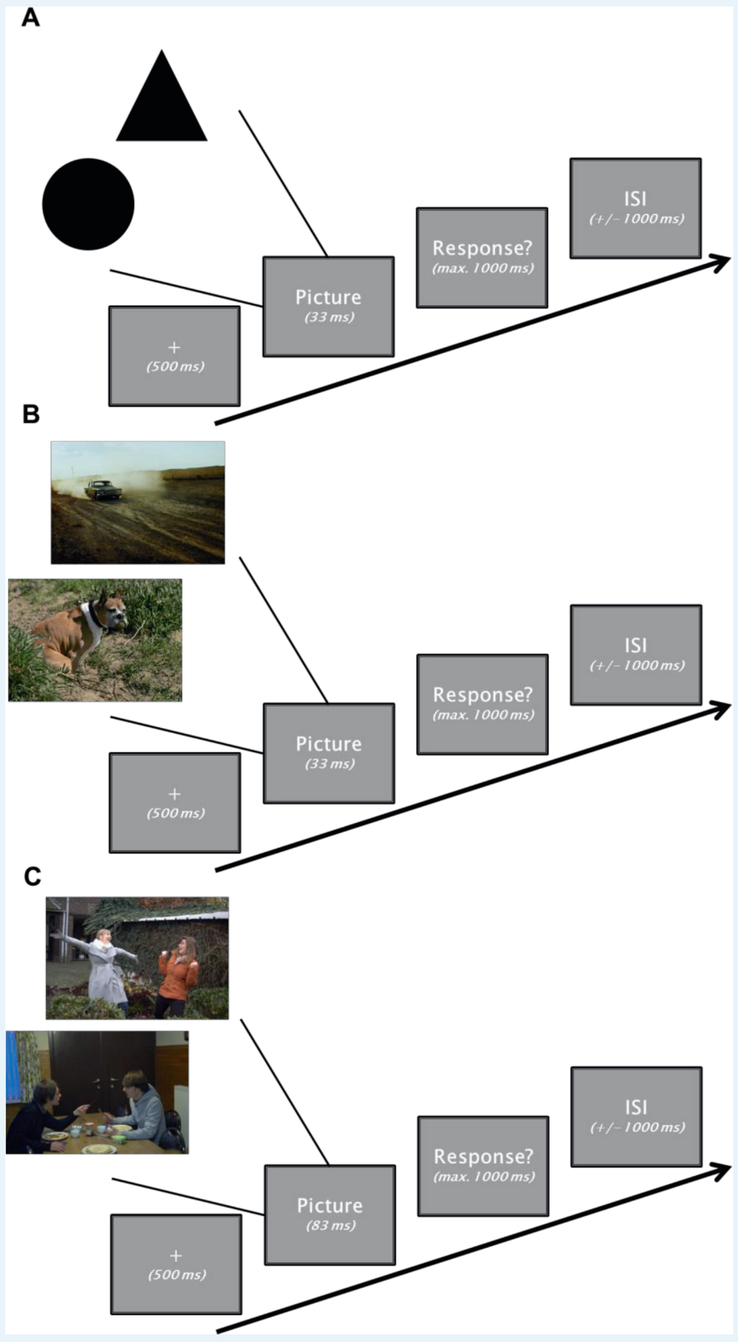
Variable	All	Adolescent boys	Adolescent girls	Adult men	Adult women
Number of participants	96	24	24	24	24
Age	17.042 (.418)	13.208 (.307)	13.348 (.271)	20.667 (.424)	20.917 (.306)
Full Scale IQ	107.406 (.791)	108.125 (2.005)	106.717 (1.444)	108.313 (1.436)	106.771 (1.465)
Verbal IQ	110.281 (.780)	110.458 (1.886)	109.217 (1.678)	109.083 (1.464)	112.083 (1.404)
Performal IQ	104.531 (1.193)	105.792 (2.751)	104.217 (1.957)	107.542 (2.432)	101.458 (1.193)

- Participants matched on gender, FSIQ and age

- Different ultra-rapid categorization tasks:
  - Baseline task
  - Animal/vehicle task
  - Social task

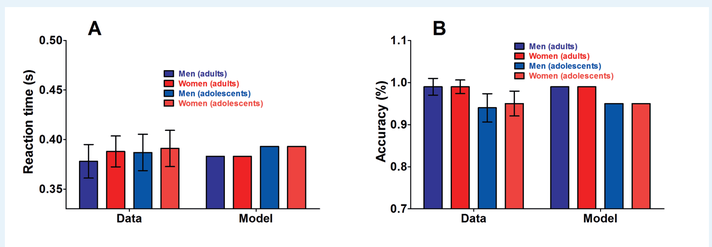
- Focus on age and gender

Experimental design and stimuli



Results

Baseline



Animal/vehicle Task

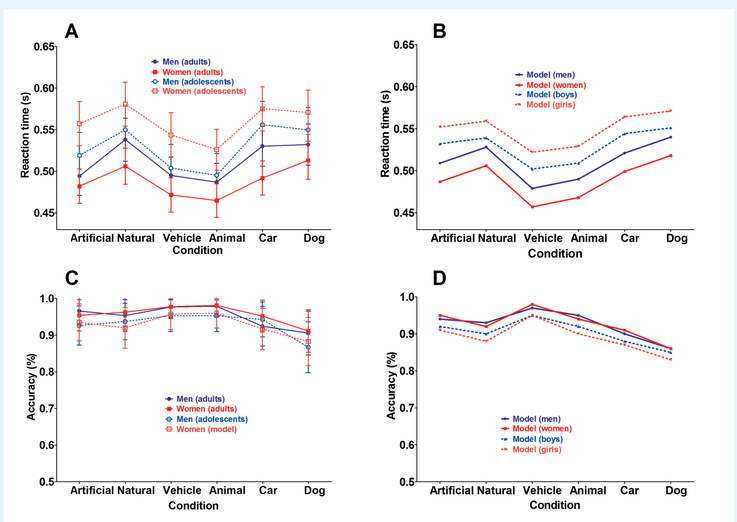
Question(s)

Was there a black circle presented on the screen?

Was there a black triangle presented on the screen?

Questions

Was the scene manmade?
Was there an animal in the scene?
Was there a dog in the scene?
Was the scene natural?
Was there a vehicle in the scene?
Was there a car in the scene?

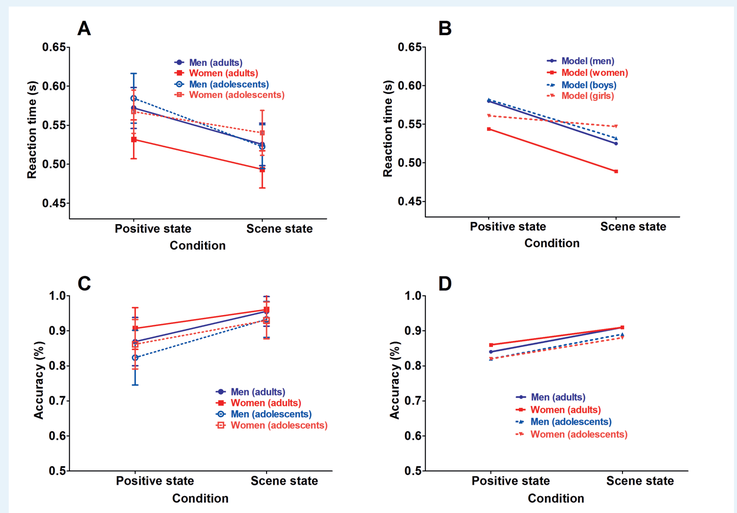


Social Task

Questions

Did the scene happen indoor?

Did the scene depict a positive interaction?



Conclusions

(1) More abstract information was available earlier than more concrete level representations of its subcategories.

(2) Participants were faster and more accurate at detecting a superordinate object embedded within a scene than to correctly categorize a superordinate scene.

(3) An inanimate processing advantage arose with age.

(4) Boys were faster (but not better) than girls of the same age in ultra-rapid categorization. When participants were older, this outcome reversed.

(5) All participants performed significantly worse and slower when the ultra-rapid categorization required a direct judgment of the social interaction in the image.

Future research

(1) Focus on a younger participant sample.
(2) Adjusting the task demands and emotional saliency of the stimuli.
(3) Assessing task-specific differences in cognitive development.

References

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